

Instructional Telecommunications
Foundation, Inc.

P.O. Box 6060
Boulder, CO 80306

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(303) 442-2707

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July 1, 1998

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

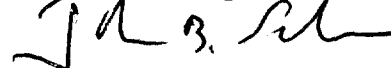
Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, DC 20554

Re: Comments in MM Docket No. 97-217 -
File No. RM-9060
Amendment of Parts 1, 21 and 74 to
Enable Multipoint Distribution
Service and Instructional Television
Fixed Service Licensees to Engage in
Fixed Two-Way Transmissions

Dear Ms. Salas:

Transmitted herewith are an original and five (5) copies of the
Comments of Instructional Telecommunications Foundation, Inc. on
ex parte submissions in the above-captioned proceeding. Should
you have any questions with respect to this filing, please
contact the undersigned.

Sincerely,



John B. Schwartz
President

Attachments

No. of Copies rec'd 0+5
List A B C D E

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

RECEIVED

JUL - 2 1998

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)
) MM Docket No.
Amendment of Parts 1, 21, and 74 to Enable) 97-217
Multipoint Distribution Service)
and Instructional Television Fixed) File No. RM-9060
Service Licensees to Engage in Fixed)
Two-Way Transmissions)

To: The Commission

COMMENTS OF

INSTRUCTIONAL TELECOMMUNICATIONS FOUNDATION, INC.

ON EX PARTE PRESENTATIONS

I. Instructional Telecommunications Foundation, Inc. ("ITF")¹
Welcomes the Ex Parte Comments of Petitioners Concerning
Protected Service Areas for ITFS Systems Which Operate Without
Excess Capacity Leases.

In a March 6, 1998, filing, the Petitioners stated: "The
reply comments evidence for the first time support within the
ITFS community for the provision of protected service areas

¹ ITF is licensee of seven stations in the Instructional Television
Fixed Service: WHR-509, Indianapolis; WHR-527, Philadelphia; WHR-512,
Sacramento; WHR-511, Kansas City; WLX-699, Salt Lake City; WLX-816, Phoenix,
and WLX-694, Las Vegas. These ITFS systems' mission is to provide
instructional service to elementary and secondary schools. ITF has leased
excess capacity on most of its stations to wireless cable companies. However,
we also have built and operated systems on a purely instructional basis. ITF
has submitted both comments and reply comments in the above-captioned
proceeding, as well as reply comments in response to the Petition for
Rulemaking.

("PSAs") to all ITFS licensees regardless of whether they lease excess capacity for commercial operations. The Petitioners do not object to the granting of a PSA to all ITFS licensees."²

As ITF pointed out in its Comments, the interference environment will be changed fundamentally if two-way transmissions are allowed in ITFS spectrum, given new interference sources such as signal boosters, response transmitters, sectorized transmitting antenna arrays, etc.³ Furthermore, PSA protection for main channel downstream transmission is necessary for consistency in the new Rules, in that the Commission has already proposed to protect response hubs of all ITFS systems, and, for limited purposes, a protected service area is assumed for all ITFS systems in the proposed booster Rules.⁴

II. Involuntary "Retuning" Rules Should Provide for Due Process and Apply Equally to all ITFS and MDS Licensees.

Petitioners propose to add a new Section 74.902(k) of the Rules for mandatory "retuning" of ITFS frequencies.⁵ These

² Letter of Paul Sinderbrand, counsel to the Petitioners, to Magalie Roman Salas, filed March 6, 1998, pp. 4-5.

³ Comments of ITF in the above-captioned proceeding, pp. 15-17. See also the *ex parte* comments of the Detroit-area Community Telecommunications Network, summarized in an attachment to the May 22, 1998 letter of Jeffrey Olson to Magalie Roman Salas.

⁴ See proposed Sections 74.985(b)(1) and 74.985(b)(2).

⁵ See Appendix C to May 19, 1998 *ex parte* submission of Petitioners, p. C-29.

proposed Rules lack due process protections that would allow ITFS licensees to oppose unnecessary or abusive retuning proposals. Like the existing involuntary modification Rules, retuning Rules need to provide an opportunity for opposition by incumbent licensees.⁶ ITF believes that retuning can be best effected by use of the current Section 74.986 of the Rules; we think that it is unnecessarily complex for the Commission to maintain multiple provisions for involuntary modifications, a state of affairs that already exists with existing sections 74.986 and 74.902(h) through (j). To add yet a third set of processes is to head in the wrong direction, with yet more overlapping provisions and opportunities for parties to disagree as to which of them applies.

ITF prefers Section 74.986 because of the policies which the Commission adopted along with them. The FCC has stated that those involuntary modification rules are intended to "not jeopardize the current or future ability of ITFS to fulfill its primary intended purpose of providing educational material for instructional use."⁷

The Petitioners' propose that the Commission order involuntary retuning if "comparable" one-way facilities can be

⁶ See Section 74.986(c) of the Commission's Rules, as well as Section 74.902(j).

⁷ Second Report and Order in Gen. Docket 90-54, paragraph 1. For a fuller discussion of the benefits of current involuntary modification Rules, see ITF's Comments in the above-captioned proceeding, pp. 17-22.

obtained on other channels.⁸ Given the likely evolution of ITFS service to two-way, as well as the possible need to upgrade current one-way transmission facilities, the availability of comparable channels as envisioned by Petitioners often may not protect future service within the meaning of present involuntary modification Rules; it is thus important that such involuntary proposals be given the broader scope of consideration that now is given in connection with Section 74.986 applications.

Further, ITF believes that involuntary modification Rules should apply equally to all ITFS and MDS stations. Apparently, such also was the intent of the Petitioners, although their initial proposal did not reflect it.⁹

Our rationale for making the rules apply to both ITFS and MDS licensees follows Petitioners' logic, as set forth in their Comments and in Petitioners' June 10 Letter. First, Petitioners aver that no single licensee should be able to block two-way conversion in a market.¹⁰ Second, Petitioners argue that

⁸ Petitioners' proposed Section 74.902(k)(3).

⁹ See letter of Paul Sinderbrand, counsel to Petitioners, to the Commission submitted on June 10, 1998 (hereinafter "Petitioners' June 10 Letter"), footnote 1, which contains new proposed language for proposed Section 21.901(b)(7) and concludes: "With this editorial change, the proposed MDS and ITFS [involuntary modification] rules become mirror images, as intended by Petitioners. The Petitioners regret any inconvenience this error [submission of their prior Section 21.901(b)(7) proposal] may have caused."

¹⁰ Comments of Petitioners, p. 106.

involuntary retuning promotes efficient use of the spectrum.¹¹

Language proposed by Petitioners is not entirely clear, but it appears to limit involuntary retuning of MDS channels to the E and F group channels, as it states "[t]he Commission shall require that an MDS station retune to other ITFS or MDS channels in the 2500-2686 MHz band."¹² [Emphasis added.] Since MDS Channels 1, 2, and 2A are the most commonly used for upstream use, the licensees of such channels have the ability to block upstream conversion in a market at least as much as do E or F group licensees, and probably more so. Further, use of channels 1 and 2 (or 2A) for upstream operation takes advantage of a natural guard band between 2.15 and 2.50 GHz, a spectrally efficient arrangement.

For these reasons, ITF urges the Commission to make clear that involuntary modification procedures apply to all MDS channels, including 1, 2, and 2A.

III. ITF Recommends That Any Outstanding Technical Issues Raised by CTN Be Resolved in an Expeditious Manner, and Be Based Upon "Real World" Technical Data.

ITF notes the lengthy, and often dyspeptic, *ex parte* colloquy in the record between the Catholic Television Network ("CTN") and Petitioners. We are dismayed by the adversarial tone

¹¹ Id., p. 108.

¹² Petitioners' June 10, 1998 letter, footnote 1.

of such exchanges, especially in light of the fact that the parties profess very similar goals in the above-captioned proceeding.

The principal issues in dispute concern whether a guard band is needed as a means of mitigating possible interference from upstream transmissions, specifically "brute force overload" of ITFS downconverters and first-adjacent channel interference.

ITF observes that while some of the submissions on this subject have been prepared by well-regarded engineering consultants, there is no information on the record which is substantiated by field testing under "real world" conditions.¹³ We note that a number of two-way technical trials are already underway which could be adapted quickly to provide useful data, and suggest that wireless cable operators, as well as CTN and other ITFS interests, be invited participate in carrying out such tests. Naturally, the Commission's engineering staff should have the opportunity to participate and act as "fair witnesses," insuring the neutrality and validity of testing procedures.

ITF believes that the quick adoption of two-way Rules is vital to both commercial and educational interests. We think

¹³ We note that AT&T and BellSouth have raised skimpy and late-filed interference concerns about two-way ITFS operation with the Commission. See the May 5, 1998 ex parte submission by Douglas I. Brandon of AT&T and the May 8, 1998 letter of Karen B. Possner of BellSouth. Surely immense telecommunications firms such as these could afford---and would desire---to buttress their technical concerns with field engineering data.

that altogether too much time and too many resources have been devoted to this seemingly endless tit-for-tat, because, in the overarching scheme of things, Petitioners and CTN are separated by comparatively minor differences of technical opinion.

In principle, we do not believe that guard bands should be employed in ITFS unless they are determined by experience to be necessary. Nonetheless, our objections to guard bands are reduced considerably by CTN's clarified proposal that such bands could consist of only 6 MHZ apiece and be used to transmit downstream program material; this revision eliminates spectral inefficiency on ITFS frequencies. Further, we believe that CTN and its allies have established convincingly that even if such guard bands are employed, there exist a number of possible architectures which still could permit two-way operation to go forward.¹⁴

At least until an adequate base of experience is developed, we find it reasonable that wireless cable operators be required to give advance notice to an ITFS licensee if they install a response transmitter in the immediate vicinity of a registered receive site. However, we find excessive CTN's proposal that 30

¹⁴ See the June 10, 1998 submission attached to the letter of Edwin N. Laverigne, counsel to Archdiocese of Los Angeles Health and Welfare Corporation, "Frequency Separation Examples."

days of testing be carried out on each such response unit.¹⁵ We presume that with transmitter and receiver in such close proximity, interference either will occur or it will not. Lengthy testing will insure only that service to two-way users (both educational and commercial) is delayed---probably long beyond the limits of their patience.

IV. ITF Can Substantiate Its Claims Concerning Interference Consent Abuse by Wireless Cable Operators.

In prior submissions in this proceeding, ITF has argued that wireless cable operators cannot be relied upon to look after the interference interests of ITFS operators, and, therefore, ITFS licensees should be required to retain independent legal and engineering counsel.¹⁶ We further averred that sometimes even large, publicly held wireless cable operators fail to adhere to their lease commitments.¹⁷

In response, Petitioners called ITF's allegations unsubstantiated.¹⁸ Petitioners' stance left ITF in the unenviable position of "blowing the whistle" in specific terms on

¹⁵ See, for example, the attachment to the March 4, 1998 letter of William D. Wallace, counsel to Catholic Television Network, "Brute Force Overload."

¹⁶ See, for instance, the Reply Comments of ITF in response to the Petition for Rulemaking, p. 10; Comments of ITF in response to the Notice of Proposed Rulemaking, pp. 23-25.

¹⁷ Reply Comments of ITF in response to the Petition for Rulemaking, p. 10.

¹⁸ Comments of Petitioners, p. 31.

some of our current lessees, or, in the alternative, leaving Petitioners' contention unrebutted. As a means out of this quandary, we sought, unsuccessfully, to reach a joint stipulation of facts with Petitioners which would eliminate the necessity of filing highly specific allegations in a public forum.

The failure to reach a stipulation of facts leaves us, regrettably, with the need to back up our prior allegations, which we do by setting forth the following cases.

Case #1 concerns the conduct of a People's Choice TV subsidiary, which leases excess capacity on WLX-816, our Phoenix D-group ITFS system. People's Choice supported the filing of the co-channel, co-polarized new ITFS application of Holy Angel School at Globe, Arizona.¹⁹ While the application putatively entailed service to the small community of Globe---located roughly 70 miles east of Phoenix---it proposes an omnidirectional transmitting antenna located atop Pinal Peak, nearly 8,000' above means sea level. This elevation is almost 7,000' above the valley in which the Phoenix metropolitan area is located. Because of the extreme height, the proposed station delivers signal over much of the Phoenix area, and this proposal causes devastating interference to a large portion of ITF's protected service area. An interference plot is attached hereto as Exhibit A.

¹⁹ BMPIF-951020BT.

Representatives of People's Choice solicited an interference consent of ITF on behalf of Holy Angel, which we supplied, albeit in rather cautious form. In that letter we declared that we would not petition to deny the Holy Angel application, although the parties agreed that ITF would have the right to shut down the school's station in the event interference occurs. Because of the extent and seriousness of predicted interference, at the time that BMPIF-951020BT went on cut-off, ITF's president wrote to Holy Angel School's principal to state that ITF had "not agreed to accept interference from the operation of Holy Angel's ITFS system, if such is authorized. In fact, in light of the pertinent engineering studies, I expect that ITF will not permit the Holy Angel ITFS system to remain on the air, pursuant to our rights as set forth in the [interference] letter." A copy of ITF's correspondence to Holy Angel School and the interference letter are attached hereto as Exhibit B.

Only People's Choice can explain its motivation for supporting an application which causes such serious interference into its own service area. However, we note that the Holy Angel application is mutually exclusive with that of the Mesa Unified School District #4,²⁰ which is backed by a rival wireless cable operator.

Case #2 concerns the conduct of a subsidiary of American

²⁰ BPLIF-951020QF.

Telecasting ("ATI"), which leases excess capacity on the C-group ITFS system licensed to Portland Regional Educational Telecommunications Corporation ("PRETC").²¹ ITF is able to report this information authoritatively because its president also serves as a principal of PRETC.

ATI operates a wireless cable system at Portland, OR, and seeks to establish "cluster" systems in the adjacent markets of Salem and Eugene, OR. With respect to Salem, ATI leases excess capacity from the C-group ITFS system of Oregon State University, WNC-718. This station originally was authorized at 10 watts at a transmitter site on Eola Hill, roughly northeast of Salem.²² This facility specifies an omnidirectional transmitting antenna pattern at an authorized transmitting antenna height of 1,276 feet AMSL.

OSU proposed to modify the facilities of WNC-718 in October, 1995.²³ This major change application sought a power increase to 50 watts at a new location: Prospect Hill. Prospect Hill is approximately 9 miles away from Eola Hill, south and slightly to the east.

A representative of American Telecasting approached PRETC in connection with the filing of OSU's 1995 proposal and requested

²¹ Call sign WHR-522.

²² See BPLIF-931230EN.

²³ See BMPLIF-951020N1.

an interference consent. No interference analysis was supplied to PRETC at that time. While PRETC provided the requested consent, it did so in a very cautious manner, similar to that used by ITF with respect to the Holy Angel application. The consent letter---which OSU also executed---states, in pertinent part: "OSU agrees to cease transmitting over the Salem, OR C group station if PRETC notifies it that the Salem, OR C group station is causing harmful interference to the operation of [PRETC's] station WHR-522 and not resume transmitting on such station until PRETC determines, in its sole discretion, that all interference has been cured."

OSU filed an amendment to the still-pending BMPLIF-951020N1 in December, 1996, the file number of which is BMPLIF-961223FN. Although this was not a new application, the file number of the December, 1996 filing replaced that of the original major modification application. According to OSU, the amendment was necessitated by the fact that the tower specified in the 1995 proposal was not suitable. Although BMPLIF-961223 proposes a slightly greater antenna height (1,415' AMSL), and slightly different site coordinates, it is generally similar to the 1995 application it replaced.

American Telecasting again requested an interference consent of PRETC in connection with the December, 1996 filing. However, by this time PRETC's president had discovered from the Phoenix

experience, among others, that wireless cable operators which operate in nearby markets at times request interference consents even when significant interference is predicted. He thus requested and received an interference showing. The proffered engineering study disclosed extensive interference to the Portland PSA. There is extensive line-of-sight from Prospect Hill into the southern portion of the PSA, most of which falls outside the 45 D/U ratio. There are patches of interference which occur in many other sections of the PSA. Among other locations, interference is predicted to occur on high ground less than 10 miles east-southeast of PRETC's transmitter site. According to data supplied by American Telecasting a D/U ratio of less than zero is predicted to occur on the PSA boundary between Portland and Salem.

A copy of an interference study of the impact of WNC-718 on PRETC's WHR-522 is attached hereto as Exhibit C. Because WHR-522 operates with two crossed-polarized cardioid antennas, the interference study shows the impact on the two halves of the WHR-522 PSA, and thus occupies two pages. This interference is extensive and serious, although not so grave as the Globe-Phoenix example.

Despite having provided an interference consent for its predecessor, PRETC petitioned to deny OSU's BMPLIF-961223FN, which application the Commission denied. OSU petitioned for

reconsideration of that decision, and PRETC has opposed. A fuller account of this case can be found in PRETC's Opposition to Petition for Reconsideration.

Again, ITF can only speculate as to ATI's motives in this case. However, we note that it may matter little to a wireless cable operator if a given site within the Portland PSA receives service from Portland or Salem. Due to hilly terrain which blocks reception from Portland, the availability of service from Salem may add more line-of-sight households in certain parts of the Portland area than the quantity lost to interference.

As to contractual misconduct by wireless cable operators, ITF considered submitting herein descriptions of some of the more tawdry examples, which have included naked breaches of the operator's obligations. However, again we are reluctant to bring embarrassing specifics before the Commission. Thus we again will leave our allegations general and presume that Petitioners will not attack our representations on this point as unsubstantiated, lest we have to repeat this unfortunate cycle of allegation, denial, and disclosure.

We believe that the foregoing exposition reveals the folly of *ex parte* comments of Wireless Holdings, Inc. ("WHI"), which were presented in a meeting with Commission staff and summarized in a letter by counsel, which states, in part: "It was suggested that FCC staff need not conduct an independent interference

analysis so long as the applications are placed on public notice and served on affected parties. It was pointed-out [sic] that there are very few licensees who do not either have the resources to monitor FCC Public Notices or who are not allied with a wireless cable operator who polices those notices on their behalf."²⁴

ITF's experience has led it to conclude that wireless cable operators cannot be relied upon to protect the interference interests of their lessors. Nonetheless, we believe that ITFS licensees often fall into ceding this function to lessees---and this opinion is confirmed by the Comments of various commercial interests in this proceeding.²⁵

These set of facts has led ITF to urge the Commission to require that ITFS applicants be independently represented by independent legal and engineering counsel.

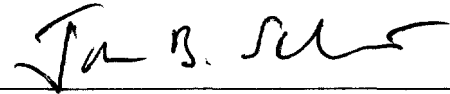
²⁴ See the May 27, 1998 letter of Robert Rini, p. 1. Mr. Rini, along with Evan D. Carb, met with the Commission staff to represent the views of WEI.

²⁵ Comments of Petitioners, p. 28, (footnote 48); comments of Wireless One of North Carolina, p.7 ("Many ITFS licensees currently rely on the wireless cable operator to whom they are leasing excess capacity to provide monitoring and evaluation of applications that affect the ITFS licensee's station.")

Respectfully submitted,

INSTRUCTIONAL TELECOMMUNICATIONS
FOUNDATION, INC.

By:

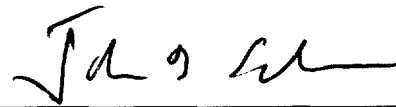


John B. Schwartz, President
P.O. Box 6060
Boulder, CO 0306

Dated: July 1, 1998

CERTIFICATION

I certify under penalty of perjury that the facts set forth in these Comments are true and correct to the best of my knowledge and belief. Signed and dated this first day of July, 1998.

A handwritten signature in dark ink, appearing to read 'John B. Schwartz', written over a horizontal line.

John B. Schwartz

Exhibit A

PARAMETERS	INTERFERING STATION	DESIRED STATION
CHANNEL(S)	D GROUP	D GROUP
CITY, STATE	GLOBE , AZ.	PHOENIX , AZ.
APPLICANT/ LICENSEE	HOLY ANGEL SCHOOL/ PROPOSED	THE INSTR. TELECOM. FOUNDATION, INC.
CALL SIGN	NEW	WLX816
LATITUDE	33.D 16.M 56.S	33.D 20.M 2.S
LONGITUDE	110.D 49.M 12.S	112.D 3.M 44.S
TRANSMITTING ANTENNA	ANDREW HMD16 O	ANDREW HMD8HW
CENTER OF RADIATION	7938. FEET AMSL	2740. FEET AMSL
ORIENTATION	.0 DEGREES	.0 DEGREES
ELECTRICAL TILT	-.50 DEGREES	-.50 DEGREES
MECHANICAL TILT	.00 DEGREES	.00 DEGREES
AT AZIMUTH	.0 DEGREES	.0 DEGREES
POLARIZATION	H	H
TRANS. POWER OUTPUT	17.0 dBW	20.0 dBW
LINE LOSS	2.50 dB	2.50 dB
2-10 MILE AVE. TERRAIN	4395. FEET AMSL	1201. FEET AMSL
RECEIVE ANTENNA HEIGHT		30. FEET AGL

INTERFERING STATION IS 71.97 MILES AT 92.8 DEGREES FROM DESIRED STATION. 10 0 MILES 10 20

KEY: H-BEYOND HORIZON OF INTERFERING STATION

>-INTERFERENCE-FREE

<=D/U SHORT BY 10 dB OR MORE

INTERFERENCE TO DESIRED STATION PSA FROM INTERFERING STATION AT 45.0 dB D/U USING FCC 2' REF. RECEIVING ANTENNA
A NUMBER IN THE PSA BELOW DENOTES THE dB VALUE BY WHICH THAT POINT FAILS TO MEET THE MINIMUM REQUIRED D/U LEVEL

INTERFERENCE



INTERFERENCE

Exhibit B

Instructional Telecommunications
Foundation, Inc.

P.O. Box 6060
Boulder, CO 80306

Telephone:
(303) 442-2707

August 29, 1997

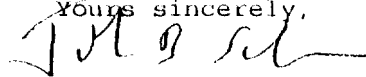
Sr. Leonie Bracker, Principal
Holy Angel School
1300 E. Cedar
Globe, AZ 85501

Dear Sr. Leonie:

Please find enclosed a copy of the executed interference letter between our organization and Holy Angel School.

I am writing this companion letter, and copying People's Choice TV, so that we all can have realistic expectations about the future. I have reviewed engineering studies which predict that the ITFS facilities for which Holy Angel has applied will cause serious interference to our Phoenix ITFS system. While ITF has agreed not to object to Holy Angel's application before the FCC, we have not agreed to accept interference from the operation of Holy Angel's ITFS system, if such is authorized. In fact, in light of the pertinent engineering studies, I expect that ITF will not permit the Holy Angel ITFS system to remain on the air, pursuant to our rights as set forth in the enclosed letter.

Yours sincerely,



John B. Schwartz
President

cc Smith Murrin

Exhibit B - Page 2

Mr. William Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW
Washington, DC 20036

Dear Mr. Caton:

Instructional Telecommunications Foundation, Inc. is the FCC licensee for the ITFS D group station in Phoenix, AZ, call sign WLX-816. Instructional Telecommunications Foundation, Inc. has reviewed the application for authorization to construct and operate a new ITFS station which has been or will be filed by Holy Angel School for a new D group station in Globe, AZ.

Instructional Telecommunications Foundation, Inc. has no objections to the application by Holy Angel School for the new Globe, AZ D group station and will not knowingly be filing a petition to deny or other formal or informal protest against the application. Instructional Telecommunications Foundation, Inc.'s consent is contingent upon Holy Angel School's agreement herein to cease transmitting over the Globe, AZ D group station if Instructional Telecommunications Foundation, Inc. notifies Holy Angel School that the Globe, AZ D group station is causing objectionable harmful interference to station WLX-816 and not resume transmitting on such station until Instructional Telecommunications Foundation, Inc. determines, in its sole discretion, that all interference has been cured..

Holy Angel School agrees to cease transmitting over the Globe, AZ D group station if either Instructional Telecommunications Foundation, Inc. notifies it that the Globe, AZ D group station is causing harmful interference to the operation of station WLX-816 and not resume transmitting on such station until Instructional Telecommunications Foundation, Inc. determines, in its sole discretion, that all interference has been cured.

This agreement may be signed in counterparts and signatures by facsimile are as originals.

Holy Angel School

By: Sr. Leonie Brackner Title: Principal

Instructional Telecommunications Foundation, Inc.

By: John A. ... Title: President

Exhibit C

PARAMETERS	INTERFERING STATION	DESIRED STATION
CHANNEL(S)	C GROUP	C GROUP
CITY, STATE	SALEM , OR.	PORTLAND , OR.
APPLICANT/ LICENSEE	OREGON STATE UNIVERSITY/ PROPOSED	PORTLAND REG. EDUC. TELECOM. CORP., INC.
CALL SIGN	WNC718	WHR522
LATITUDE	44.D 51.M 18.S	45.D 29.M 20.S
LONGITUDE	123.D 7.M 14.S	122.D 41.M 40.S
TRANSMITTING ANTENNA	ANDREW HMD16 O	ANDREW HMD16HC
CENTER OF RADIATION	1415. FEET AMSL	1512. FEET AMSL
ORIENTATION	.0 DEGREES	50.0 DEGREES
ELECTRICAL TILT	-.50 DEGREES	-.50 DEGREES
MECHANICAL TILT	.00 DEGREES	.00 DEGREES
AT AZIMUTH	.0 DEGREES	.0 DEGREES
POLARIZATION	H	H
TRANS. POWER OUTPUT	17.0 dBW	17.0 dBW
LINE LOSS	2.00 dB	6.00 dB
2-10 MILE AVE. TERRAIN	332. FEET AMSL	309. FEET AMSL
RECEIVE ANTENNA HEIGHT		30. FEET AGL
INTERFERING STATION IS 48.47 MILES AT 205.4 DEGREES FROM DESIRED STATION.		10 0 MILES 10 20

KEY: H-BEYOND HORIZON OF INTERFERING STATION

>=INTERFERENCE-FREE

<=D/U SHORT BY 10 dB OR MORE

INTERFERENCE TO DESIRED STATION PSA FROM INTERFERING STATION AT 45.0 dB D/U USING FCC 2' REF. RECEIVING ANTENNA
A NUMBER IN THE PSA BELOW DENOTES THE dB VALUE BY WHICH THAT POINT FAILS TO MEET THE MINIMUM REQUIRED D/U LEVEL

INTERFERENCE

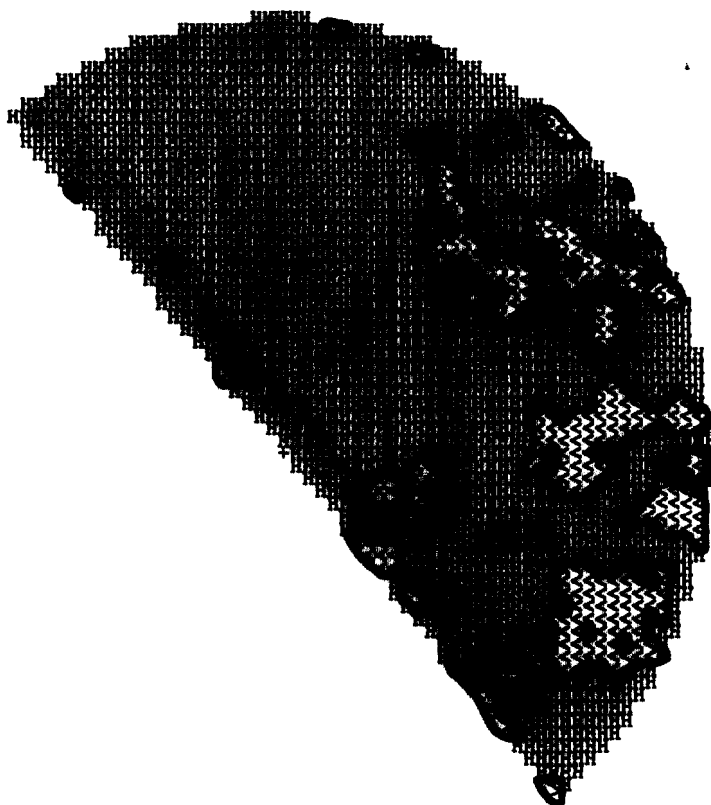


Exhibit C - Page 2

PARAMETERS	INTERFERING STATION	DESIRED STATION
CHANNEL(S)	C GROUP	C GROUP
CITY, STATE	SALEM, OR.	PORTLAND, OR.
APPLICANT/ LICENSEE	OREGON STATE UNIVERSITY/ PROPOSED	PORTLAND REG. EDUC. TELECOM. CORP., INC.
CALL SIGN	WNC718	WHR522
LATITUDE	44.D 51.M 18.S	45.D 29.M 20.S
LONGITUDE	123.D 7.M 14.S	122.D 41.M 40.S
TRANSMITTING ANTENNA	ANDREW HMD16 O	ANDREW HMD16VC
CENTER OF RADIATION	1415. FEET AMSL	1512. FEET AMSL
ORIENTATION	.0 DEGREES	230.0 DEGREES
ELECTRICAL TILT	-.50 DEGREES	-.50 DEGREES
MECHANICAL TILT	.00 DEGREES	.00 DEGREES
AT AZIMUTH	.0 DEGREES	.0 DEGREES
POLARIZATION	H	V
TRANS. POWER OUTPUT	17.0 dBW	17.0 dBW
LINE LOSS	2.00 dB	6.00 dB
2-10 MILE AVE. TERRAIN	332. FEET AMSL	309. FEET AMSL
RECEIVE ANTENNA HEIGHT		30. FEET AGL

INTERFERING STATION IS 48.47 MILES AT 205.4 DEGREES FROM DESIRED STATION. 10 0 MILES 10 20

KEY: H-BEYOND HORIZON OF INTERFERING STATION >=INTERFERENCE-FREE <=D/U SHORT BY 10 dB OR MORE

INTERFERENCE TO DESIRED STATION PSA FROM INTERFERING STATION AT 45.0 dB D/U USING FCC 2' REF. RECEIVING ANTENNA
A NUMBER IN THE PSA BELOW DENOTES THE dB VALUE BY WHICH THAT POINT FAILS TO MEET THE MINIMUM REQUIRED D/U LEVEL

INTERFERENCE

